

# Acarina associated with Protea flowers in the Cape Province

by

P. A. J. RYKE

Institute for Zoological Research, Potchefstroom University

## INTRODUCTION

The flowers of the proteas are in many-flowered, usually solitary, heads enclosed in an involucre of numerous imbricate bracts. The protea plants are shrubs or trees, each of which may be regarded as a separate ecological mesostand composed of several microstands. The entire protea community, consisting of many plants, constitutes a macrostand. Each microstand, the protea heads, harbours an animal microassociation which — especially in the tree forms — recur frequently, but because of their relatively small size, the total area covered by the different minor stands is small. These microassociations, consisting mainly of small arthropods and other invertebrates, are well protected in the natural microhabitats provided by the proteas. Needham (1948) described a similar community composed of the seed eaters, juice suckers, nectar feeders, gall makers, predators, parasites, scavengers and seekers of temporary shelter, which inhabit the flower heads of the plant *Bidens pilosa*.

A study of the principles and concepts pertaining to the organization of the microcommunity in the protea head as an ecological unit would certainly be of great theoretical value. The flowers of some of the *Protea* species are relatively large (more than six inches in diameter) and can accommodate a vast number of small invertebrate animals. After the flowering season the flower sometimes tends to close up and the animals which accumulated in the capitulum are still comfortably protected in the dry cone.

From a preliminary survey of the fauna associated with proteas it appears that Acarina are the dominant group in the flower heads. In the dry flowers Collembole and the larvae of other insects were also found to be present in relatively large numbers. Only one phytophagous mite species is known to occur on proteas, the others being either predacious or feeding on dead organic matter. Ryke (1954) pointed out that the presence of many predacious forms preying on the phytophagous animals which enter the capitulum may contribute to the fact that these flowers can be kept indoors for a long period without deterioration of their condition. The majority of these species do not leave the flower after it has been picked.

By virtue of its numbers the predacious mite, *Proctolaelaps vanderbergi* (Ryke), is the ecological dominant in the microassociations of live flowers of several protea species. As regards *Protea mellifera* they are, however, not as abundant in the dry cones in which insect larvae are present in large numbers. The mites evidently rely on insects and birds (such as honey-birds) for transportation to fresh flowers. This is especially true of the above-mentioned *Proctolaelaps* which sometimes occur in their hundreds near the open end of the flower, swarming onto any object entering it.

It appears that at least some of the Acarina are restricted to the protea flower habitat. Conspecific specimens of several mite species were recovered from plants growing a few hundred miles apart. It was also noticed that these mites sometimes exhibit a degree of intraspecific variation. There are, however, no indications, as yet, that any one of the mite species is "host specific" as regards a particular *Protea* species.

In recent papers Ryke (1962a) and Meyer and Ryke (1959) described several mite species which were collected from the flowers and, in one instance, the leaves of proteas in the Cape Province. The present paper is a short summary of the data concerning those species previously described, as well as descriptions of new species, all of which are free-living members of the Mesostigmata. The type specimens of these new species are deposited in the collections of the Institute for Zoological Research, Potchefstroom University.

The author wishes to express his sincere appreciation to Dr G. Owen Evans of the British Museum (Natural History), London for helpful suggestions; to Prof. H. B. Rycroft, Director of the National Botanic Gardens, Kirstenbosch for supplying some of the material on which this paper is based; and to Prof. J. A. van Eeden for reading the manuscript.

## TROMBIDIFORMES

### FAMILY TETRANYCHIDAE

*Oligonychus proteae* Meyer and Ryke, 1959

*Oligonychus proteae* Meyer and Ryke, 1959, *J. ent. Soc. S. Afr.* 22: 344.

**HABITAT AND LOCALITY:** Collected from flowers of *Protea incompta*, Humansdorp (C.P.), phytophagous.

### FAMILY ANYSTIDAE

*Anystis baccarum* (L.)

*Anystis baccarum* (L.). Redescribed by Meyer and Ryke, 1960, *J. ent. Soc. S. Afr.* 23: 178.

**HABITAT AND LOCALITY:** Collected from the leaves of *Protea* species, Grabouw (C.P.).

## MESOSTIGMATA

## FAMILY SCHIZOGYNIIDAE

*Mixogynium proteae* Ryke, 1957

*Mixogynium proteae* Ryke, 1957, *Ann. Mag. nat. Hist.* (12) 10: 579.

HABITAT AND LOCALITIES: Collected from flowers of *Protea incompta*, Humansdorp (C.P.) and *P. mellifera*, Grabouw (C.P.); also recently from *P. longifolia*, near Stanford (C.P.).

## FAMILY ACEOSEJIDAE

*Proctolaelaps (Proctolaelaps) vanderbergi* (Ryke, 1954), figs. 1-8

*Garmania vanderbergi* Ryke, 1954, *J. ent. Soc. S. Afr.* 17: 241.

*G. proteae* Ryke, 1954, *Ibidem* 17: 243.

The adult female and male were described by Ryke (1954). Recently many adult as well as immature forms were collected from *Protea longifolia*, *P. neriifolia* and *P. mellifera*, and the author was able to examine the larva, protonymph, deutonymph and adult female and male. The basic pattern of the chaetotaxy of the dorsum is very similar to that of other aceosejids as outlined by Evans (1958).

LARVA: *Dimensions*: Length 250-289  $\mu$ ; breadth 163-192  $\mu$ .

The anterior dorsal shield is provided with nine pairs of small, simple to slightly spine-like setae (fig. 1). The pygidial shield on the posterior third of the dorsum bears five pairs of setae. The striated integument between these two shields has only three pairs of setae, those on the dorsolateral aspect being placed on minute tubercles (fig. 2). The vertical setae are more than twice as long as any other seta on the dorsum.

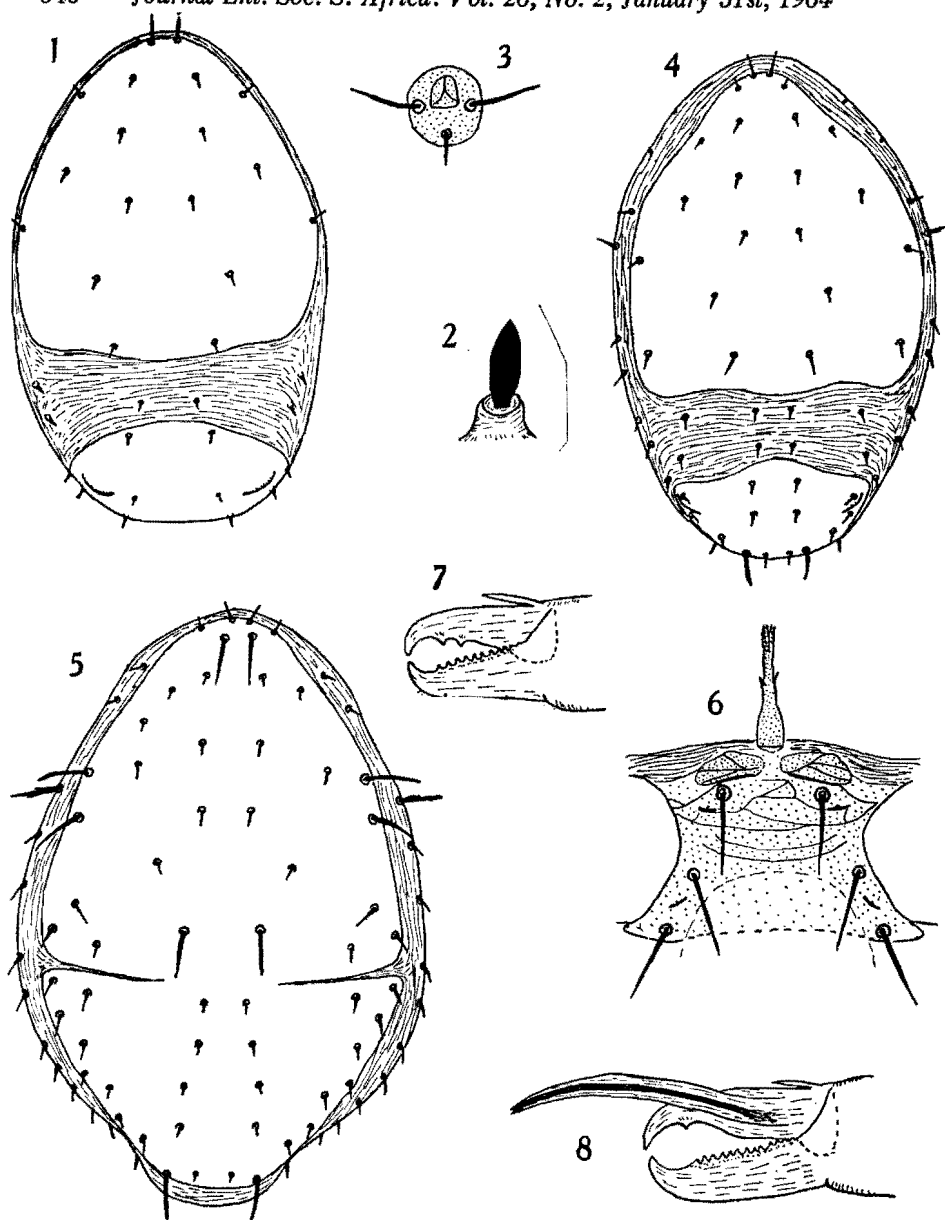
The venter, gnathosoma and legs are normal for free-living parasitoid larvae. The para-anal setae are long and conspicuous and are situated in line with the posterior margin of the anus (fig. 3).

PROTONYMPH: *Dimensions*: Length 320-346  $\mu$ ; breadth 190-209  $\mu$ .

The dorsum of the protonymph (fig. 4) is also covered by two shields, the anterior one bearing 11 pairs of setae. The pygidial shield carries eight pairs of setae. The striated cuticle flanking the anterior shield is provided with four distinct pairs of setae, the anterior parts showing indications of another two pairs. The membrane between the two shields bears seven pairs of setae.

DEUTONYMPH: *Dimensions*: Length 375-394  $\mu$ ; breadth 245-269  $\mu$ .

As was pointed out by Evans (1958) the single dorsal shield of the deutonymphs of the genus *Proctolaelaps* (and other genera) is characterized by the presence of lateral incisions indicating incomplete fusion of the anterior and posterior shield (fig. 5). This stage differs from all the other stages



Figs. 1-8. *Proctolaelaps (Proctolaelaps) vanderbergi* (Ryke).

Fig. 1, dorsum of larva; fig. 2, seta on tubercle; fig. 3, circumanal setae of larva; fig. 4, dorsum of protonymph; fig. 5, dorsum of deutonymph; fig. 6, sternal shield of female; fig. 7, chelicera of female; fig. 8, chelicera of male.

(including the adults) in having six pairs of relatively long setae, the scapular setae on the lateral integument even having one or two serrations. The anterior part of the shield is provided with 15 pairs, the posterior part with 14 pairs and the lateral interscutal membrane with 13 pairs of setae.

**FEMALE: Dimensions:** Length 380-480  $\mu$ ; breadth 250-370  $\mu$ .

The pre-endopodal shields are not very distinct in all the specimens examined and they give the impression of being attached to the anterior part of the sternal shield (fig. 6). The anterior margin of the sternal shield does not form a clear line to distinguish it from the striated integument on which the tritosternum is situated.

The chelicerae are typical; the fixed digit has a row of closely set teeth and the movable digit is bidentate (fig. 7).

**MALE:** The males are usually slightly smaller than the females. The movable digit of the chelicera is unidentate and it bears a prominent spermatophoral process (fig. 8); the fixed digit is similar to that of the female.

**HABITAT AND LOCALITIES:** Collected (usually in large numbers) from *Protea mellifera* and *P. barbigera*, Grabouw and Kirstenbosch (C.P.); *P. incompta*, Humansdorp (C.P.); *P. longifolia*, Stanford (C.P.); *P. neriifolia*, Humansdorp (C.P.). This species is probably a common inhabitant of most of the *Protea* species in the Cape Province.

*P. (Proctolaelaps) pygmaeus* (Müller, 1859)

**P. (Proctolaelaps) pygmaeus** (Müller, 1859, *Lotos* 9: 30).

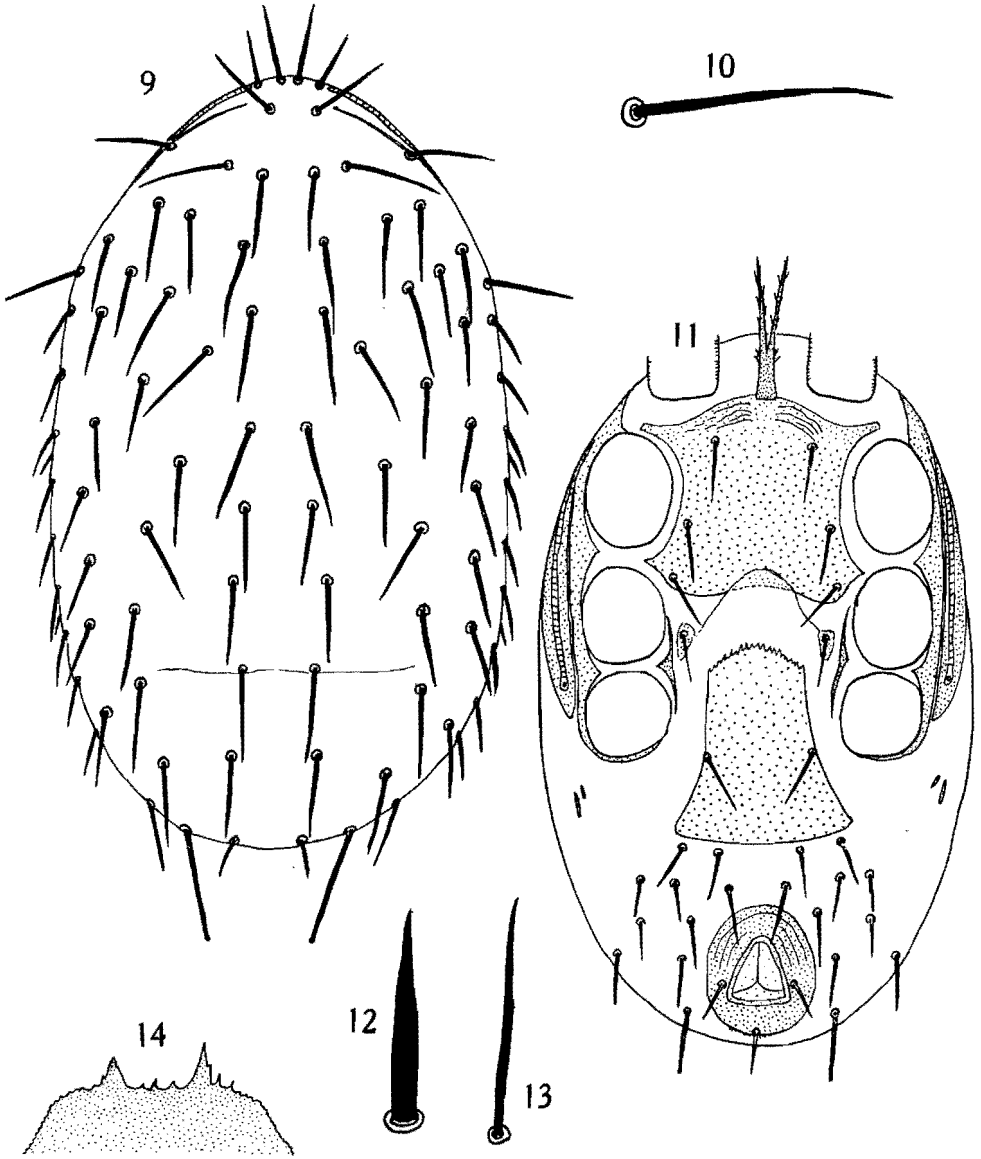
**Hypoaspis hypudaei** Oudemans, 1902, *Tijdschr. Ent.* 45: 21.

**FEMALE: Dimensions:** Length 348  $\mu$ ; breadth 206  $\mu$ .

**Dorsum** (fig. 9). The entire dorsal shield is provided with 44 pairs of relatively long, smooth setae (fig. 10), 21 pairs of which are placed on the "posterior dorsal shield" (Evans, 1958). The marginal setae ( $M_1$ - $M_6$ ) are situated on the shield, the seta appearing between  $M_3$  and  $M_4$  as well as the one anterior to  $M_1$  probably belonging to the ventral interscutal membrane series.

**Venter** (fig. 11). The sternal shield bears three pairs of setae and its anterior margin reaches to the base of the tritosternum. The metasternal shields each bears a seta. The genital shield has the normal two setae and the anal shield is provided with the three circum-anal setae; the anal opening is enlarged. The distribution of the setae on the ventral interscutal membrane is illustrated in fig. 11. The peritremes reach anteriorly to a position near the vertical setae.

**Gnathosoma.** This species is characterized by the presence of sinuous corniculi and stout, spine-like rostral setae (fig. 12). The slender capitular setae (fig. 13) are slightly longer than the rostrals. The tectum (fig. 14) has a denticulate anterior margin. The fixed digit of the chelicera is multidentate.



Figs. 9-14. *Proctolaelaps (Proctolaelaps) pygmaeus* (Müller), female.

Fig. 9, dorsum; fig. 10, dorsal seta; fig. 11, venter; fig. 12, rostral seta; fig. 13, capitular seta; fig. 14, tectum.

*Legs.* All the legs are provided with simple setae, claws and pulvilli.

**HABITAT AND LOCALITY:** One female specimen from a dry flower of *Protea mellifera*, Grabouw (C.P.), January 1955. This is a cosmopolitan species (Evans, 1958). It is also known to occur in decaying organic matter in the Transvaal.

*Lasioseius (Lasioseius) proteae* spec. nov., figs. 15-20

**FEMALE: Dimensions:** Length 425-440  $\mu$ ; breadth 250-275  $\mu$ .

*Dorsum* (fig. 15). The reticulated entire dorsal shield is provided with 23 pairs of setae, the majority of which are slightly serrate (fig. 16); the marginal setae are situated on the interscutal membrane. These features are characteristic of the *Melichares*-type of dorsum in the Aceosejinae (Evans, 1958). According to Evans there are normally 15 pairs of setae on the "posterior dorsal shield", but in some species a reduction in number occurs. In the present species the reduction went further with the result that, not only the dorsal series, as in *L. berlesei* (Oudemans), but also the median and lateral series are affected (fig. 15). The number of setae in the dorsal series (J) is the same as that of *L. berlesei* but J<sub>3</sub> appears to be present and J<sub>2</sub> to be absent in *proteae*. The positions of the six pairs of simple setae on the interscutal membrane are similar to those of *berlesei*, the first two pairs corresponding with the "anterior dorsal shield". The number of setae on the latter is also reduced.

*Venter* (fig. 17). The sternal shield bears the usual three pairs of setae and the metasternal setae are situated on shields. There is a slight indication of sclerotization anterior to the sternal shield. The wedge-shaped genital shield is very similar to that of *L. berlesei* and it lies in close proximity to the anterior margin of the ventri-anal shield. The latter is reticulated and it bears six pairs of pre-anal setae. The para-anal setae are placed on a line immediately anterior to the hind margin of the anus; the postanal seta is relatively well developed. The ventral interscutal membrane is provided with a prominent pair of slightly serrate setae. All the other setae on the venter are simple. The two pairs of smallish metapodal shields are relatively widely removed from the ventri-anal shield; in this respect it differs from species such as *L. berlesei* and *L. confusus* Evans, both of which have a similarly large ventri-anal shield.

The tritosternum has two pilose laciniae. The peritrematal shield is fused with the exopodal shields posteriorly and with the dorsal shield anteriorly. The peritreme reaches anteriorly to a position on the dorsum immediately in front of the vertical setae (fig. 15). The endopodal shields are relatively well developed in the region of coxa III and IV.

*Gnathosoma* (fig. 18). The corniculi are relatively short and widely separated distally. The ventral groove is provided with seven transverse rows of denticles. The specialized seta on the palptarsus is two-pronged. As in *L. berlesei* the

fixed digit of the chelicera (fig. 19) bears a row of closely set teeth along its entire length; the movable digit is provided with two strong teeth and a third very small one proximally. The anterior margin of the tectum (fig. 20) is multidentate; some of the denticles are prominent and these are placed on three projections.

*Legs.* All the legs are provided with claws and pulvilli; the setae on the legs are simple.

**HABITAT AND LOCALITY:** ♀ - Holotype and two ♀ - paratypes from *Protea incompta*, Humansdorp (C.P.), April 1955, flowers collected by H. B. Rycroft.

#### FAMILY AMEROSEIIDAE

*Ameroseius proteae* spec. nov., figs 21-29

**FEMALE: Dimensions:** Length 366-433  $\mu$ ; breadth 215-282  $\mu$

*Dorsum* (fig. 21). The ornamented entire dorsal shield bears 29 pairs of serrate setae (fig. 22),  $M_1$  and  $M_2$  in the median series being smaller than the others. The vertical setae (fig. 23) are situated on small protuberances of the dorsal shield. The posterior part of the shield has a semi-circular strongly sclerotized strip along its margin. The ornamentation on the shield and the distribution of the setae are shown in fig. 21.

*Venter* (fig. 24). The sternal shield is provided with two pairs of setae; setae III are placed on small shields and the metasternal setae are situated on the striated cuticle. The endopodal shields between coxae II and III are triangular in shape whereas those between III and IV are more slender. The genital shield bears a pair of setae and it is flanked by two minute oval-shaped shields.

The interscutal membrane between the hind margin of the genital shield and the anterior margin of the anal shield is provided with four pairs of setae. The anal shield bears a pair of para-anal setae on a line near the posterior part of the prominent anal aperture. The setal base of the postanal seta is equidistant from the hind margins of the anus and the anal shield. The striated integument on the lateral sides of the shield bears two pairs of setae, the hindmost pair being conspicuous and serrate; all the setae on the venter except this pair on the posterior margin are simple.

A pair of small, inconspicuous metapodal shields is present near the lateral margin of the venter. The peritrematal shield curves round the

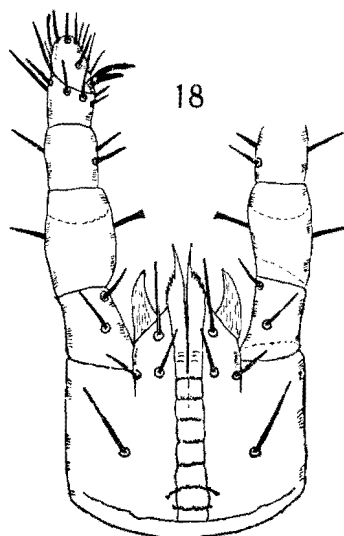
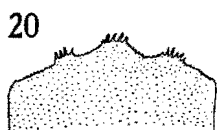
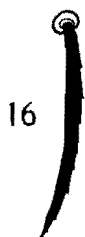
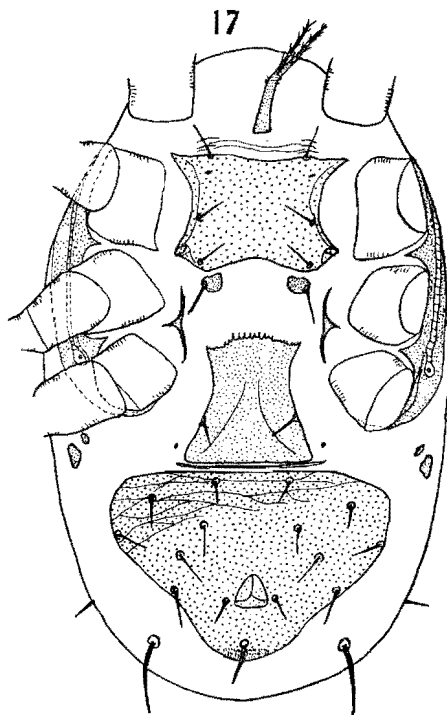
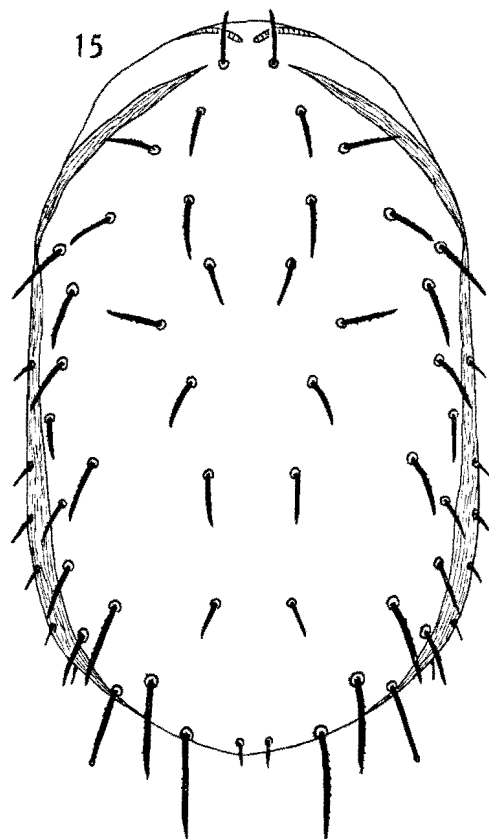
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#### EXPLANATIONS OF FIGURES

Figs. 15-20. *Lasioseius (Lasioseius) proteae* spec. nov., female.

Fig. 15, dorsum; fig. 16, dorsal seta; fig. 17, venter; fig. 18, gnathosoma; fig. 19, chelicera; fig. 20, tectum.





posterior part of coxa IV. The stigma is situated on a line slightly behind the anterior margin of coxa IV. The peritreme reaches antieriad beyond the middle of coxa I. The tritosternum has a long serrate base and two pilose laciniae.

*Gnathosoma* (fig. 25). The corniculi are typically divided distally and the two are well separated. The specialized seta on the palptarsus is two-pronged (fig. 26). The anterior portion of the tectum (fig. 27) is triangular and it has a slightly serrate front margin. The fixed digit of the chelicera (fig. 28) bears three strong teeth in its proximal half; the movable digit appears to be devoid of distinct teeth.

*Legs*. All the legs are provided with claws and pulvilli (fig. 29). The majority of the setae on the legs are simple but some are distinctly serrate.

**HABITAT AND LOCALITIES:** ♀ - Holotype and four ♀ - paratypes collected from the dry flower of *Protea mellifera*, Grabouw (C.P.), January 1955; 10 ♀ - paratypes from *P. incompta*, Humansdorp (C.P.), April 1955; one ♀ - paratype from *P. neriifolia*, Humansdorp (C.P.), August 1955. The flowers of *mellifera* were collected by the author and those of *incompta* and *neriifolia* by H. B. Rycroft. The specimens recovered from the protea material from Humansdorp were much larger than those from Grabouw. Apart from the fact that the specimens were found in different *Protea* species, those from *mellifera* were extracted from a closed dry flower whereas the *incompta* and *neriifolia* flowers were relatively fresh.

#### FAMILY MACROCHELIDAE

*Macrocheles rycrofti* spec. nov., figs. 30-39

This species is closely related to *Macrocheles merdarius merdarius* (Berlese), *M. merdarius africanus* Ryke and Meyer and *M. merdarius proteae* described below. It can, however, readily be separated from them by the relatively long vertical setae, the nature of the ornamentation on the shields of the venter and the relative dimensions.

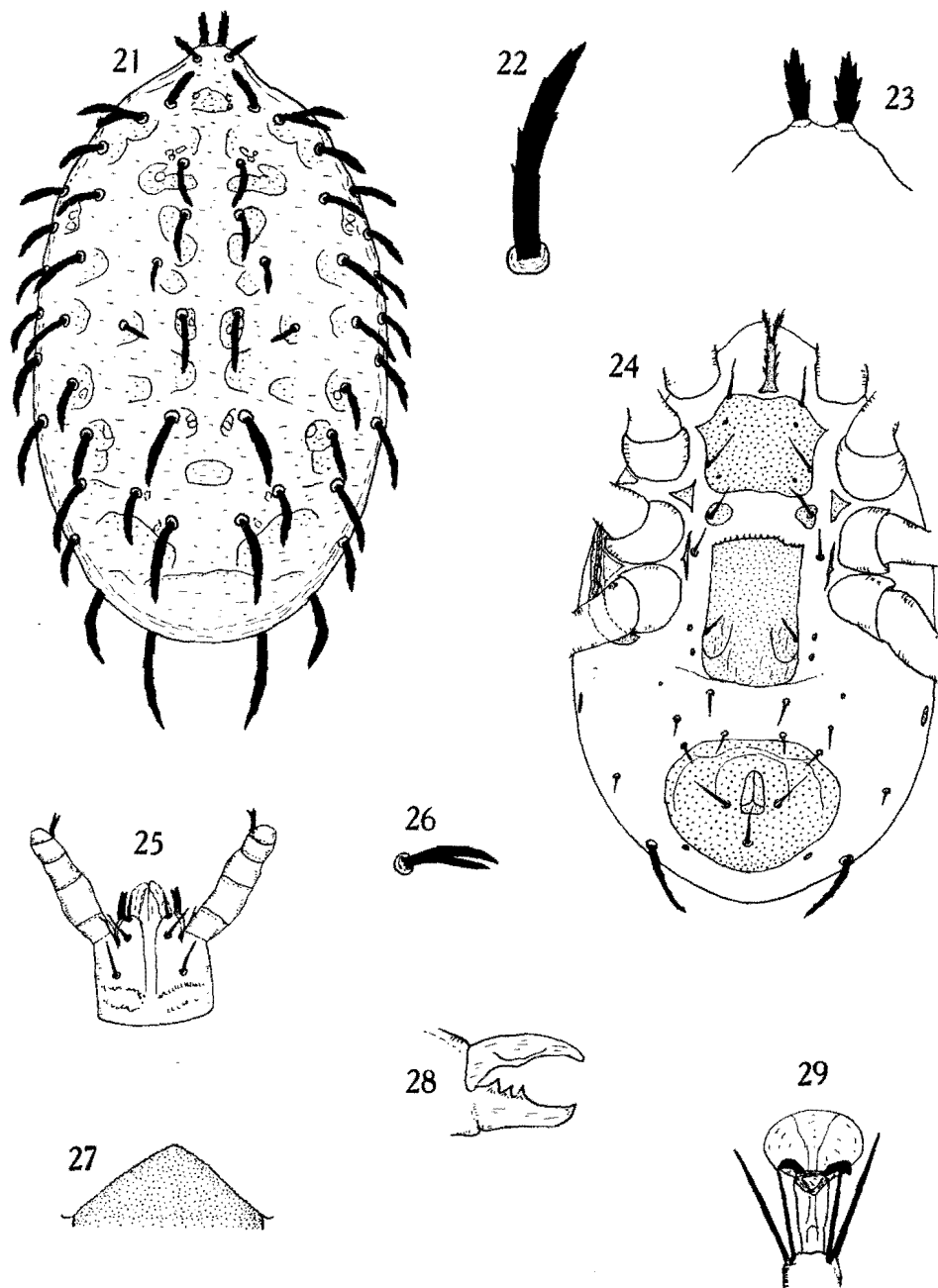
**FEMALE: Dimensions:**

Length of dorsal shield . . . . .	577-664 $\mu$
Breadth of dorsal shield . . . . .	346-400 $\mu$
Length of sternal shield in median line . . . . .	134-159 $\mu$

#### EXPLANATIONS OF FIGURES

Figs. 21-29. *Ameroseius proteae* spec. nov., female.

Fig. 21, dorsum; fig. 22, dorsal seta; fig. 23, vertical setae; fig. 24, venter, fig. 25, gnathosoma; fig. 26, specialized palptarsal seta; fig. 27, tectum; fig. 28, chelicera; fig. 29, ambulacrum of leg I.



Breadth of sternal shield between coxae II . . .	105-116 $\mu$
Length of ventri-anal shield . . . . .	185-220 $\mu$
Breadth of ventri-anal shield . . . . .	160-211 $\mu$
Length of leg IV (excluding ambulacrum) . . .	558-626 $\mu$

*Dorsum.* The distribution of the 28 pairs of setae on the reticulated dorsal shield (fig. 30) is very similar to that of *M. merdarius* s. lat. The majority of the setae are ordinary simple setae (fig. 31) whereas some are almost rod-like, tapering only at the distal tips (fig. 32). The vertical setae (fig. 33) are not subspinose as in *merdarius* but are relatively long with flat distal portions. The nature and distribution of the pores on the shield also resemble those of *merdarius*.

*Venter.* The pattern formed by the punctate lines on the sternal shield is shown in fig. 34. The small oblong metasternal shields are provided with the normal setae. The punctate lines on the genital shield are arranged in the form of an A. The truncate hind margin of the genital shield lies practically contiguous to the straight anterior margin of the ventri-anal shield. The latter bears the normal three pairs of simple setae in addition to the circumanal setae. The punctate lines on this shield are illustrated in the figure.

*Gnathosoma.* As in the *merdarius* group the fixed digit of the chelicera is provided with a large tooth as well as a small one in its distal half; the movable digit is bidentate (fig. 35). The dorsal seta is relatively broad and flat; the ventral setae are similar to those of *africanus* and *proteae*.

The shape of the tectum is shown in fig. 36; basically it resembles that of *merdarius*. The few serrations on the two branches of the median processes are not present in the specimens examined.

*Legs.* The legs are normal. The spurs and spines on leg II are not as conspicuous as those of *africanus*.

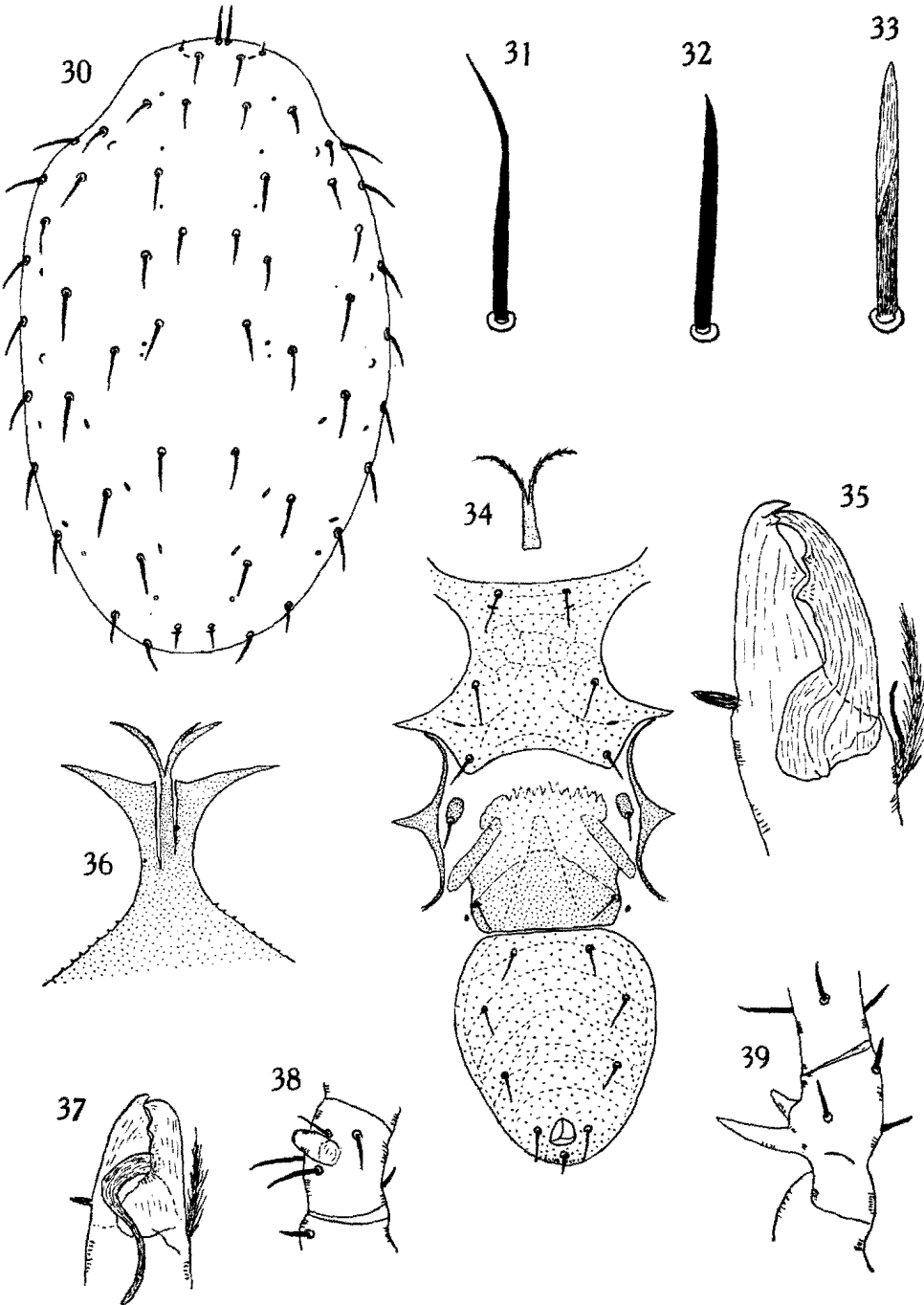
**MALE: Dimensions:** Length 475  $\mu$ ; breadth 280  $\mu$ .

The sterniti-genital shield bears the usual number of setae. The ventri-anal shield resembles that of the female. The chaetotaxy of the dorsum is basically the same as that of the female. The movable digit of the chelicera bears a relatively long spermatophoral process (fig. 37). The femur of leg II (fig. 38) is armed with a large spur. Femur IV is heavily armed with spurs (fig. 39).

## EXPLANATIONS OF FIGURES

Figs. 30-39. *Macrocheles rycrofti* spec. nov.

Figs. 30-36, female. Fig. 30, dorsum; fig 31, simple dorsal seta; fig. 32, rod-like dorsal seta; fig. 33, vertical seta; fig. 34, ventral shields; fig 35, chelicera; fig. 36, tectum. Figs. 37-39, male. Fig. 37, chelicera; fig. 38, femur of leg II; fig. 39, femur of leg IV.



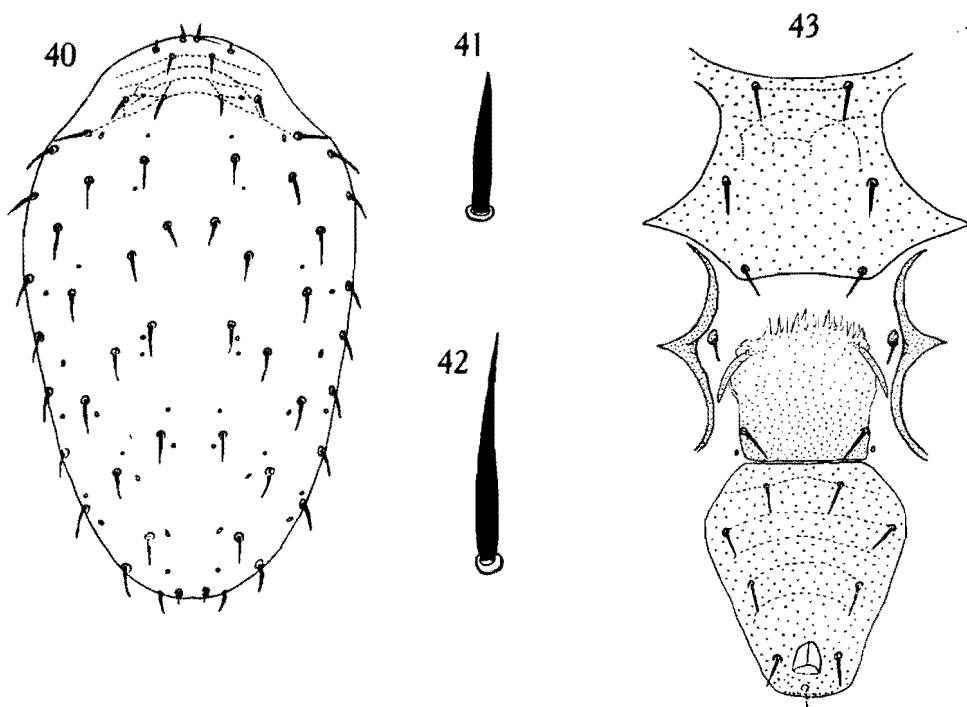
**HABITAT AND LOCALITY:** ♀ - Holotype, two ♀ - paratypes and ♂ - allotype collected from a dry flower of *Protea mellifera*, Grabouw (C.P.), January 1955, collected by the author.

***Macrocheles merdarius proteae* subsp. nov., figs. 40-43**

This subspecies can be distinguished from *merdarius* and *africanus* on the basis of its dimensions and the pattern formed by the punctures on the sternal shield.

**Dimensions:**

Length of dorsal shield . . . . .	395 $\mu$
Breadth of dorsal shield . . . . .	231 $\mu$
Length of sternal shield . . . . .	98 $\mu$
Breadth of sternal shield . . . . .	82 $\mu$
Length of ventri-anal shield . . . . .	116 $\mu$
Breadth of ventri-anal shield . . . . .	98 $\mu$
Length of leg IV . . . . .	345 $\mu$



Figs. 40-43. *Macrocheles merdarius proteae* subsp. nov., female.

Fig. 40, dorsum; fig. 41, vertical seta; fig. 42, dorsal seta; fig. 43, ventral shields.

*Dorsum.* The reticulated dorsal shield (fig. 40) closely resembles that of *M. merdarius merdarius*. As in the other subspecies the vertical setae (fig. 41) are subspinose. The other dorsal setae (fig. 42) are simple. The chaetotaxy of the dorsal shield and the distribution of the pores are depicted in fig. 40.

*Venter* (fig. 43). The sternal, metasternal, genital and ventri-anal shields are typical of *merdarius* sens. lat. This subspecies occupies an intermediate position between *merdarius* s. str. and *africanus* as regards the ratio length of sternal shield/breadth of ventri-anal shield. The ornamentation of the sternal shield differs from that of the other forms, but the ventri-anal shield resembles that of *merdarius merdarius*.

*Gnathosoma and legs.* The chelicerae and tectum are basically similar to those of the related forms. The legs are normal.

**HABITAT AND LOCALITY:** ♀ - Holotype collected from a dry flower of *Protea mellifera*, Grabouw (C.P.), January 1955, collected by the author.

#### FAMILY RHODACARIDAE

*Cyrtolaelaps (Gamasellus) grabouwensis* spec. nov., figs. 44-50

**DEUTONYMPH:** *Dimensions:* Length 250-260  $\mu$ ; breadth 154-162  $\mu$ .

This species is closely related to *C. (Gamasellus) vulgaris* Vitzthum and *C. (G.) aeronauta* Vitz., both of which are known only from deutonymphs. According to Vitzthum (1920) *vulgaris* was collected from *Stomoxys calcitrans* and *Musca domestica* whereas *aeronauta* was recovered from Anthomyiidae species; both mite species, however, were also found in rotting leaves. The present species which was collected from a dry flower of a protea may also have been associated with insects visiting the flower or it might have found the dry cone, in which dead organic matter accumulated, a suitable habitat. As was pointed out by Ryke (1961, 1962a) these deutonymphs also resemble the genus *Saintdidieria* Oudemans in many respects; the only characteristic separating this genus from them is the fact that some of the setae on the coxae are modified into club-like processes.

All these above-mentioned deutonymphs as well as the species of *Saintdidieria* (also only known from deutonymphs) have the following characteristics in common: The vertical setae are short and spine-like; the anterior dorsal shield usually bears 23 pairs of setae and the posterior dorsal shield 14 pairs; the sterniti-genital shield is provided with five pairs of setae; the tectum has a basal portion and a median transparent process; the legs are relatively short and stout; the tip of tarsus I bears a long seta which is situated on a small tubercle. Only an examination of adult specimens could elucidate the correct taxonomic position of these species. The species *C. (G.) curvicrinus* Berlese may perhaps be added to this group of species.

*Dorsum* (fig. 44). The reticulated divided dorsal shield covers the major part of the dorsum. The anterior dorsal shield bears 23 pairs of setae and

the posterior shield 14 pairs. The interscutal membrane flanking the latter shield is provided with three pairs of setae. All the setae are simple except the vertical setae (fig. 45) which are spine-like.

*Venter* (fig. 46). The sterniti-genital shield bears five pairs of setae and two pairs of pores. The anal shield has the usual three circumanal setae. The distribution of the setae on the ventral interscutal membrane is shown in the figure. The endopodal shields are prominent. The peritreme is conspicuous and reaches anterior to a position beyond the middle of coxa I.

*Gnathosoma*. The specialized seta on the palptarsus is three-pronged (fig. 47). The shape of the tectum is illustrated in fig. 48. Both digits of the chelicera are tridentate (fig. 49).

*Legs*. The legs are relatively short and stout and are provided with claws and pulvilli. The tip of tarsus I bears a conspicuous seta which is placed on a small tubercle (fig. 50). The setae on the legs are simple, some approaching a spine-like condition.

**HABITAT AND LOCALITY:** ♀ - Holotype and two ♀ - paratypes collected from a dry flower of *Protea mellifera*, Grabouw (C.P.), January 1955, collected by the author.

*Cyrtolaelaps (Digamasellus) proteae* Ryke, 1962

*Cyrtolaelaps (Digamasellus) proteae* Ryke, 1962, *J. ent. Soc. S. Afr.* 25: 94.

**HABITAT AND LOCALITY:** Collected from a flower of *Protea mellifera*, Grabouw (C.P.).

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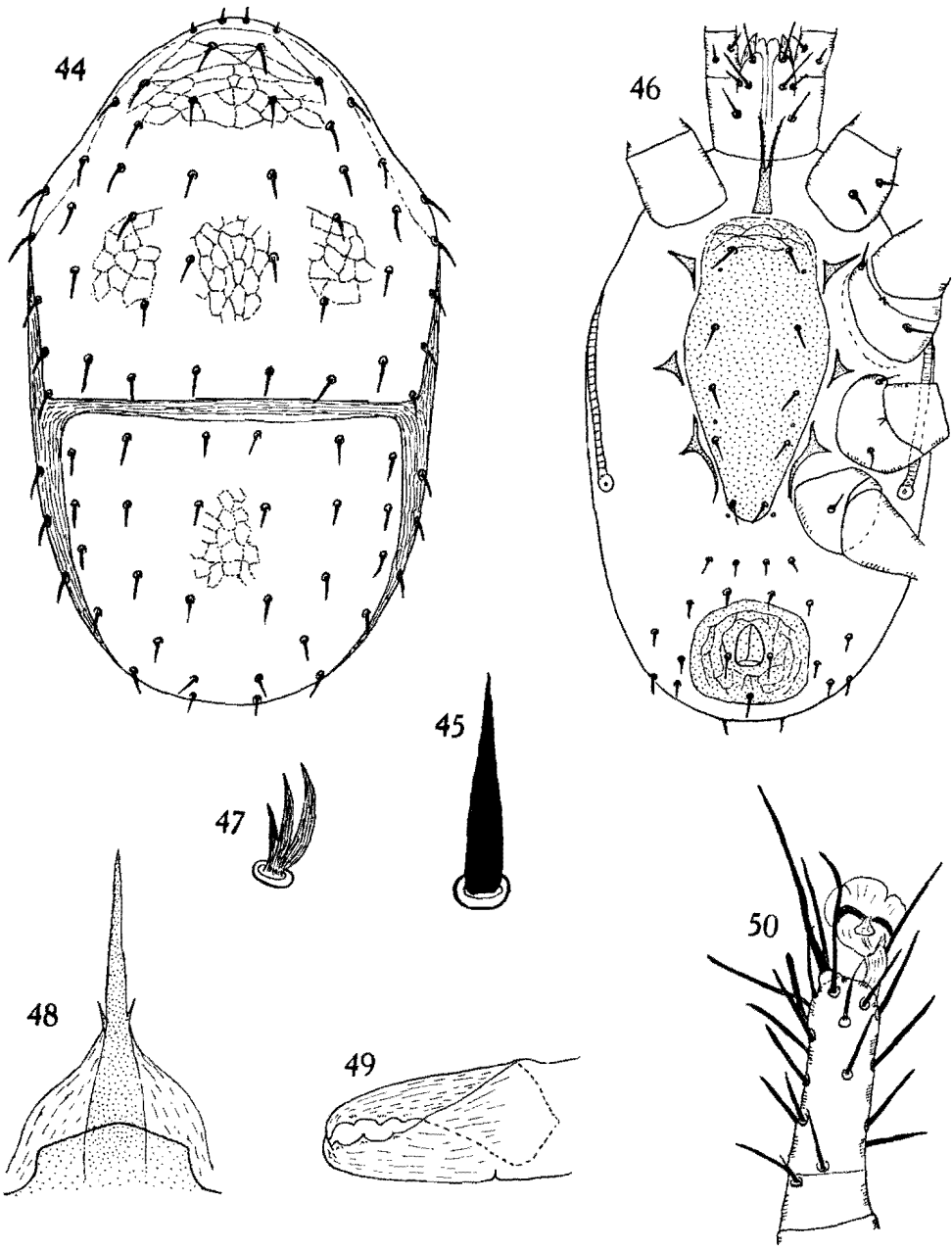
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## EXPLANATIONS OF FIGURES

Figs. 44-50. *Cyrtolaelaps (Gamasellus) grabouwensis* spec. nov., deutonymph.

Fig. 44, dorsum; fig. 45, vertical seta; fig. 46, venter; fig. 47, specialized palptarsal seta; fig. 48, tectum; fig. 49, chelicera; fig. 50, tarsus of leg I.





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